IN THE CLAIMS:

Please amend claims as follows:

1. (Amended) A method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen in an image generating arrangement, such as the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of the illuminated specimen, comprising:

determining at least one spectral centroid and;

determining a maximum of emission radiation and/or of absorbed radiation of the illuminated specimen.

2. (Amended) The method according to claim 1, wherein the determination of the centroid and of the maximum of the emission radiation of fluorochromes is carried out for distinguishing different dyes or for determining the local dye composition of an image point when a plurality of dyes are used simultaneously or for determining the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached or for measuring emission ratio dyes for determining ion concentrations.

3. (Amended) The method according to claim 1, wherein the determination of the centroid and of the maximum of the reflected or transmitted excitation radiation of fluorochromes is carried out for distinguishing different dyes or for determining the local dye composition of an image point when a plurality of dyes are used simultaneously or for determining the local shift in the absorption spectrum depending on the local environment to which the dye or dyes is or are attached or for measuring the absorption ratio for determining ion concentrations.

4. (Amended) The method according to claim 1, further comprising splitting the emission radiation of the specimen a dispersive element and is detected in a spatially resolved manner in at least one direction.

5. (Amended) The method according to claim 1, further comprising splitting the

fluorescent radiation.

6. (Amended) The method according to claim 1, further comprising splitting the radiation reflected or transmitted by the specimen is split by a dispersive element for absorption measurement and is detected in a spatially resolved manner in at least one direction.

7. (Amended) The method according to claim 1, further comprising carrying out a spectral weighting between a plurality of detection channels,

summing of weighted channels of signals of the detection channels; and

summing of the detection channels is carried out.

8. (Amended) The method according to claim 1, further comprising weighting the signals of the detection channels in that they are multiplied by a weighting curve,

generating a sum signal in that the sum of the channels taken into account is determined, and

generating a position signal is generated in that the sum of weighted signals is divided by the sum signal.

10. (Amended) The method according to claim 1, further comprising:

converting signals of detection channels digitally;

reading out the signals of the detection channels and;

weighting and summing the signals of the detection channels digitally in a computer.

11. (Amended) The method according to claim 10, wherein the weighting and summing of the signals of the detection channels are carried out with analog data processing by means of a resistance cascade.

12. (Amended) The method according to claim 11, further comprising adjusting the resistances.

13. (Amended) The method according to claim 8, further comprising adjusting the weighting curve.

14. (Amended) The method according to claim 1, further comprising influencing the signals of detector channels by a nonlinear distortion of the input signals.

15. (Amended) The method according to claim 1, further comprising adjusting the integration parameters.

16. (Amended) The method according to claim 1, further comprising adjusting a characteristic or response curve of an amplifier.

17. (Amended) The method according to claim 8, further comprising determining in analog a position signal and;

determining in analog the sum signal,

converting the position signal and the sum signal and;

reading out digitally the position signal and the sum signal.

18. (Amended) The method according to claim 7, wherein an upper and a lower signal corresponding to the sum of the signals of individual channels which are weighted by opposing weighting curves are read out, digitally converted and fed to the computer.

19. (Amended) The method according to claim 8, wherein a position signal and the sum signal are used to generate an image.

22. (Amended) The method according to claim 8, wherein a position signal and the sum signal are combined with a lookup table.

24. (Amended) The method according to claim 1, wherein a comparison of a measured signal with a reference signal is carried out via comparators in detection channels and in case the reference signal is not reached or is exceeded a change in a operating mode of a detection channel is carried out.

25. (Amended) The method according to claim 24, wherein a respective detection channel is switched off or not taken into account.

26. (Amended) The method according to claim 1, wherein a relevant spectral region is narrowed in this way.

27. (Amended) The method according to claim 1, wherein signals of detection channels are generated by at least one integrator circuit.

28. (Amended) The method according to claim 1, wherein signals of detection channels are generated by photon counting and subsequent digital-to-analog conversion.

29. (Amended) The method according to claim 1, wherein a photon counting is carried out in time correlation.

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37. (Amended) The method according to claim 1, using an X-Y scanner in illumination means.

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48. (Amended) An arrangement for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen, particularly the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of an illuminated specimen, comprising:

means for determining at least one spectral centroid,

and means for determining a maximum of emission radiation, or of absorbed radiation.

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52. (Amended) The arrangement according to claim 48, wherein a spectral weighting is carried out between a plurality of detection channels, summing of weighted channels of the signals of the detection channels and summing of detection channels is carried out.

53. (Amended) The arrangement according to claim 52, wherein signals of detection channels are weighted in that they are multiplied by a weighting curve, a sum signal is generated in that the sum of the channels taken into account is determined, and a position signal is

generated in that the sum of weighted signals is divided by the sum signal.

55. (Amended) The arrangement according to claim 52, wherein signals of detection channels are converted and digitally read out and weighting and summing are carried out digitally in a computer.

57. (Amended) The arrangement according to claim 56, wherein resistances are adjustable.

59. (Amended) The arrangement according to claim 53, wherein a position signal and the sum signal are determined in analog, converted, and read out digitally.

60. (Amended) The arrangement according to claim 52, wherein an upper and a lower signal corresponding to the sum of the signals of individual channels which are weighted by opposing weighting curves are read out, digitally converted and fed to the computer.

61. (Amended) The arrangement according to claim 53, wherein a position signal and the sum signal are used to generate an image.

64. (Amended) The arrangement according to claim 53, wherein a position signal and the sum signal are combined with a lookup table.

66. (Amended) The arrangement according to claim 48, wherein a comparison of a measured signal with a reference signal is carried out via comparators in detection channels and in case the reference signal is not reached or is exceeded a change in a operating mode of a detection channel is carried out.

67. (Amended) The arrangement according to claim 48, wherein a respective detection channel is switched off and/or not taken into account.

68. (Amended) The arrangement according to claim 48, wherein a relevant spectral region is narrowed in this way.

71. (Amended) The arrangement according to claim 70, wherein a photon counting is carried out in time correlation.

79. (Amended) The arrangement according to claim 48, including an X-Y scanner in illumination source.